



An Introduction to Six Sigma

Ben Dobbs

www.bd-comms.eu

Introduction

How do you feel today?

2



3



1



7



6



5



4



11



9



8



10



Objectives

1. To know what Six Sigma is and what is involved in Six Sigma.
2. To understand key concepts linked to Six Sigma including quality, defects and waste.
3. To know basic Six Sigma formulae and approaches including the Six Sigma equation and DMAIC.
4. To consider why organisations need this and why we, as Business English trainers, should be concerned about this.
5. To be able to use several of the non-statistical tools used in Six Sigma as tasks and language carriers in training.

A Question

What is the purpose of the in-company trainer (regardless of topic)?

Simple! The trainer is a catalyst for improvement.

Training is never conducted for its own sake.

Six Sigma takes this one step further by making improvement the focus.

What is This?

What do you know about this?

6σ

B
D
Communications

What is Six Sigma?

Six Sigma (6σ) is a set of techniques and tools for the improvement of workplace process, traditionally focusing on manufacturing. Six Sigma asserts:

- **Continuous efforts are needed to achieve results**
- **Desirable results are ones that are stable and predictable.**
- **Such results are imperative to the success of a business.**
- **Any and all processes must have characteristics that can be defined, measured, analysed, improved, and controlled (DMAIC)**
- **There must be commitment from the entire organisation in order to achieve greater quality.**

Six Sigma has:

- **A project focus**
- **A clear focus on achieving measurable results and returns.**
- **An emphasis on strong and committed management, leadership and support.**
- **A need for data in support of decisions, change and initiatives.**

History

Six Sigma was introduced by American engineer Bill Smith while working at Motorola in 1986.

Other international firms recorded huge savings after applying Six Sigma. These have included General Electric, Johnson & Johnson, Sony and Boeing.

Since then, it has become a standard practice now in multinational companies, especially those involved in manufacturing.

Its use has now expanded into other areas including IT and healthcare.



Six Sigma Quality

A key factor in determining a process's sigma level is the defects per million opportunities (DPMO).

The term "sigma" comes from statistics and is used in statistical quality control which evaluates processes. A "sigma" is a measure of deviation. This is what Six Sigma quality looks like:

Sigma level	DPMO (without "shift")
1	690,000
2	308,538
3	66,807
4	6,210
5	233
6	3.4

Six Sigma Level / Accreditations



Champions: guide the team through organizational support and resources, removing obstacles.



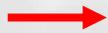
Master black belts: manage the strategic direction of the Six Sigma programme; full time commitment to Six Sigma.



Black belts: lead problem-solving Six Sigma teams.



Green belts: assist with data collection and analysis for black belt projects.



Yellow belts: review overall activities and participate as project team members and subject matter experts (SMEs) in their area.



White belts: have a basic understanding of the Six Sigma concepts and what is involved on Six Sigma projects.

The Six Sigma Equation

desired result or
outcome you want to
achieve

input, factors, variables or
elements needed to create the
outcome

$$y = f(x) + \epsilon$$

process applied to
the variables by
which they are
changed

(optional) some level of error or the
amount of difference due to
uncertainty

The Six Sigma Equation

In an e-mail marketing campaign:

1. **“y” could be the number of items sold**
2. **“f” could be email opens from an e-mail marketing shot**
3. **“x” may be the number of discount vouchers in the email.**

As you increase the number of vouchers - x , then the function of email opens - f - yields more product sales - y .

Communications

CTQ, Processes and SIPOC

Companies must understand what customers do not want - defects - and what they do want - the Critical to Quality elements known as CTQs. This allows a company to meet expectations. To do this, a company needs to understand their own processes.

A process is a series of activities that converts inputs into outputs. For Six Sigma to be effective, an organisation must understand its processes.

One way to understand processes is to use a SIPOC diagram:

Suppliers	Inputs	Processes	Outputs	Customers

The Basic Methodology - (R)DMAIC(RS)

This methodology originally had five phases (DMAIC) to which others were later added (RDMAIC, RDMAICRS):

- R** **Recognise** the issue or problem
- D** **Define** the problem or issue
- M** **Measure** aspects of the current process and collect data
- A** **Analyse** the data; investigate and find the root cause(s)
- I** **Improve** processes, conduct tests and experiments, correct errors
- C** **Control** the improved process, set up systems and checks
- R** **Realise** the results; see, record and report on the improvements
- S** **Sustain** the improvements making sure old ways are not repeated

Six Sigma and Lean

Lean is a manufacturing process that was developed by Toyota in 1988.

It is based upon two key principles:

1. The removal of irregularity
2. The removal of irrelevance

The main idea behind a “lean” process is to get the most streamlined process within a production environment. It wants to create the most consistently “good product” in the most efficient way.

This links to Six Sigma in many ways - one of the most important being the focus on removing or reducing waste.

Six Sigma and Waste

Six Sigma identifies eight types of waste:

Talent (people)	Inventory (storage)	Motion (movement / activity)	Waiting (time between steps)
Transportation (shipping of items or material)	Defects (repairs, faults and so on)	Overproduction (effort in making things that are not needed)	Extra processing (pointless process steps or duplicated work)

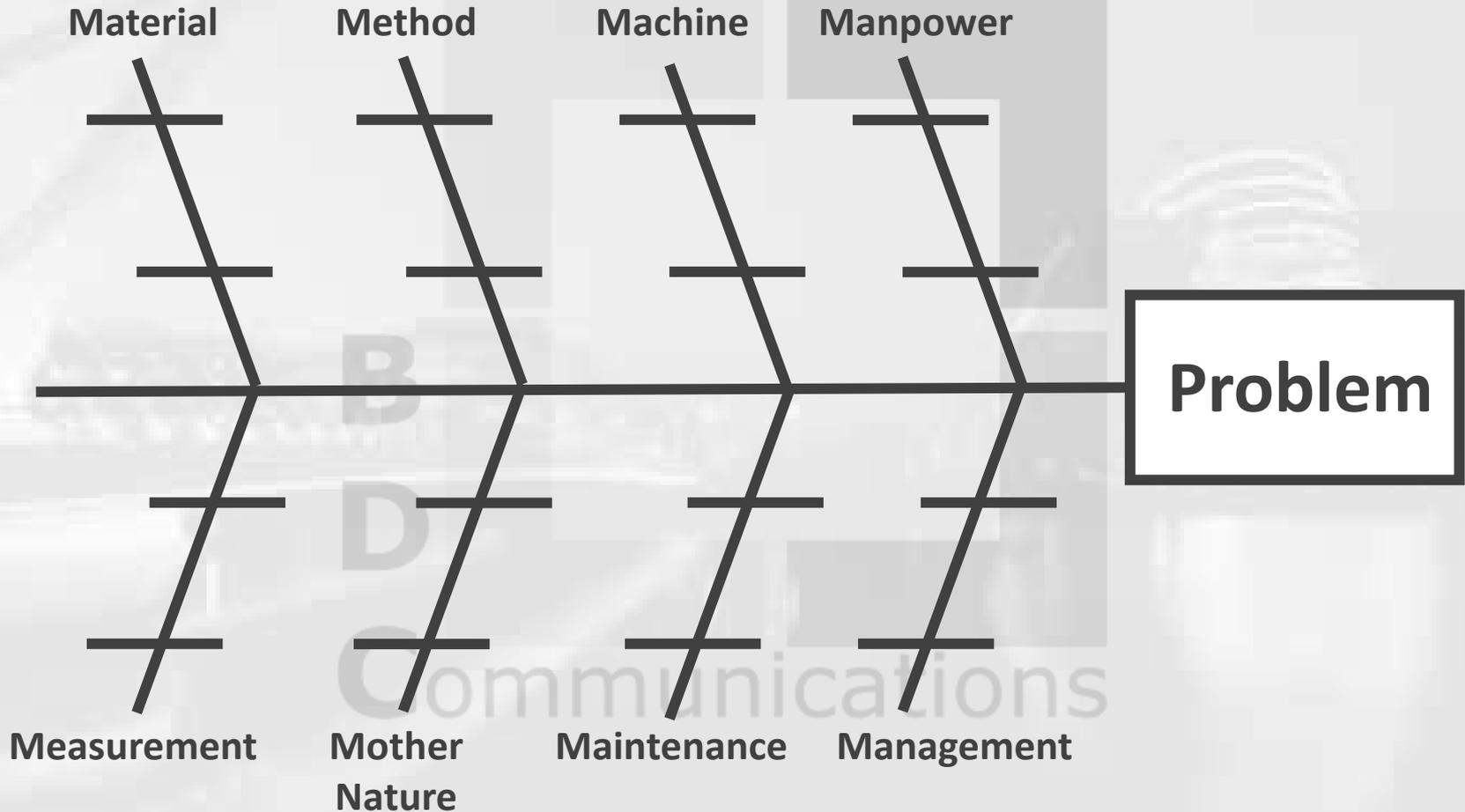
Related Concepts

Six Sigma makes use of a range of statistical and non-statistical project and quality management tools that can be used in the training room.

Non-statistical tools for language trainers include:

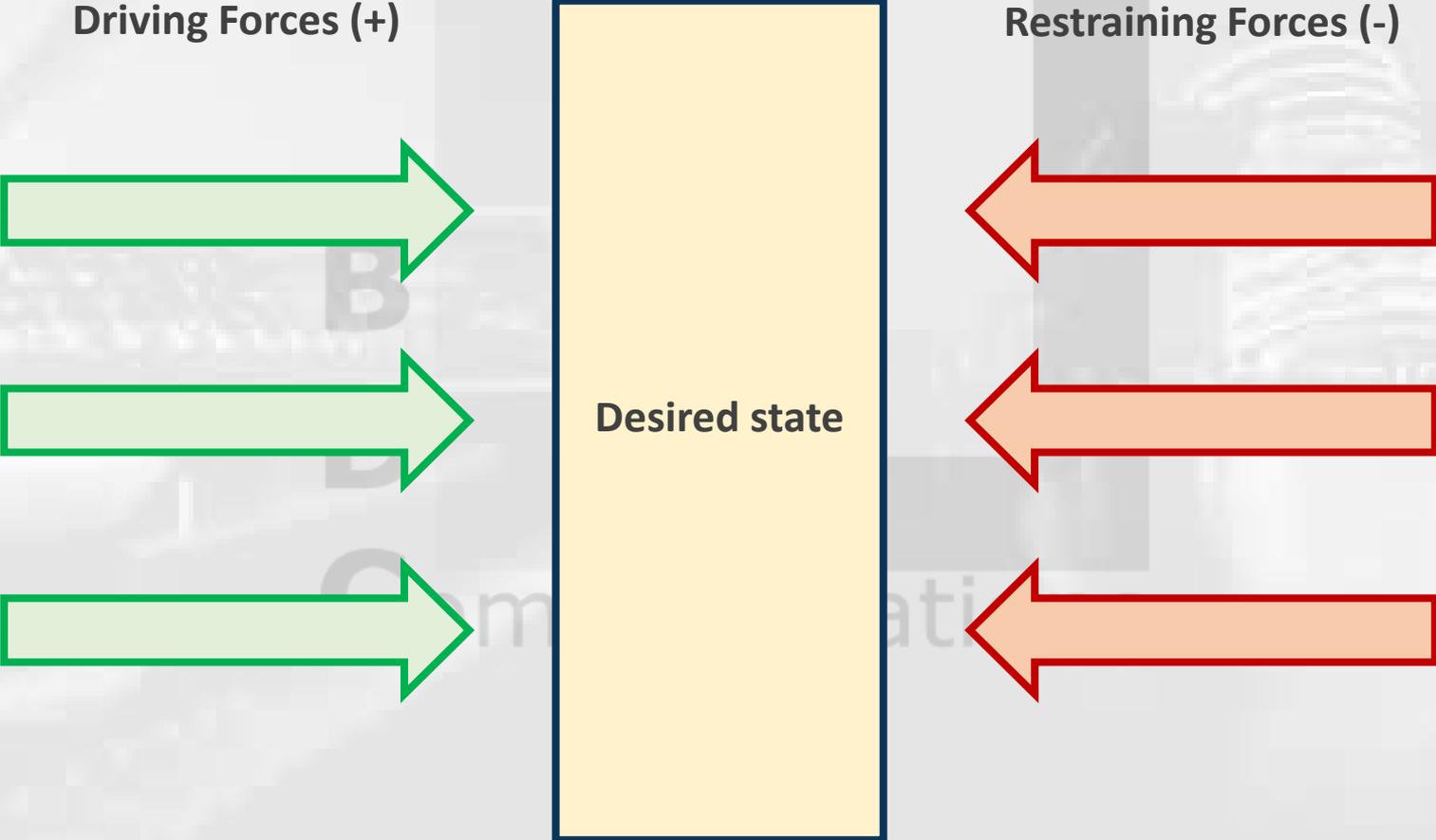
- **Five “why?” and seven “so what?”**
- **Fishbone / Ishikawa diagrams**
- **5 S** (“sort”, “set In order”, “shine”, “standardise” and “sustain”)
- **Kaizen** (continuous improvement)
- **PDCA cycle** (plan, do, check, act)
- **Pareto analysis** (time spent and the 80:20 principle)
- **Flowcharts**
- **Kanban** (a visual working method using boards and sticky notes)
- **TQM** (process of detecting and reducing or eliminating errors)
- **“Poka yoke”** (“idiot proofing”)
- **Forcefield analysis**

Fishbone / Ishikawa Diagrams - Categories



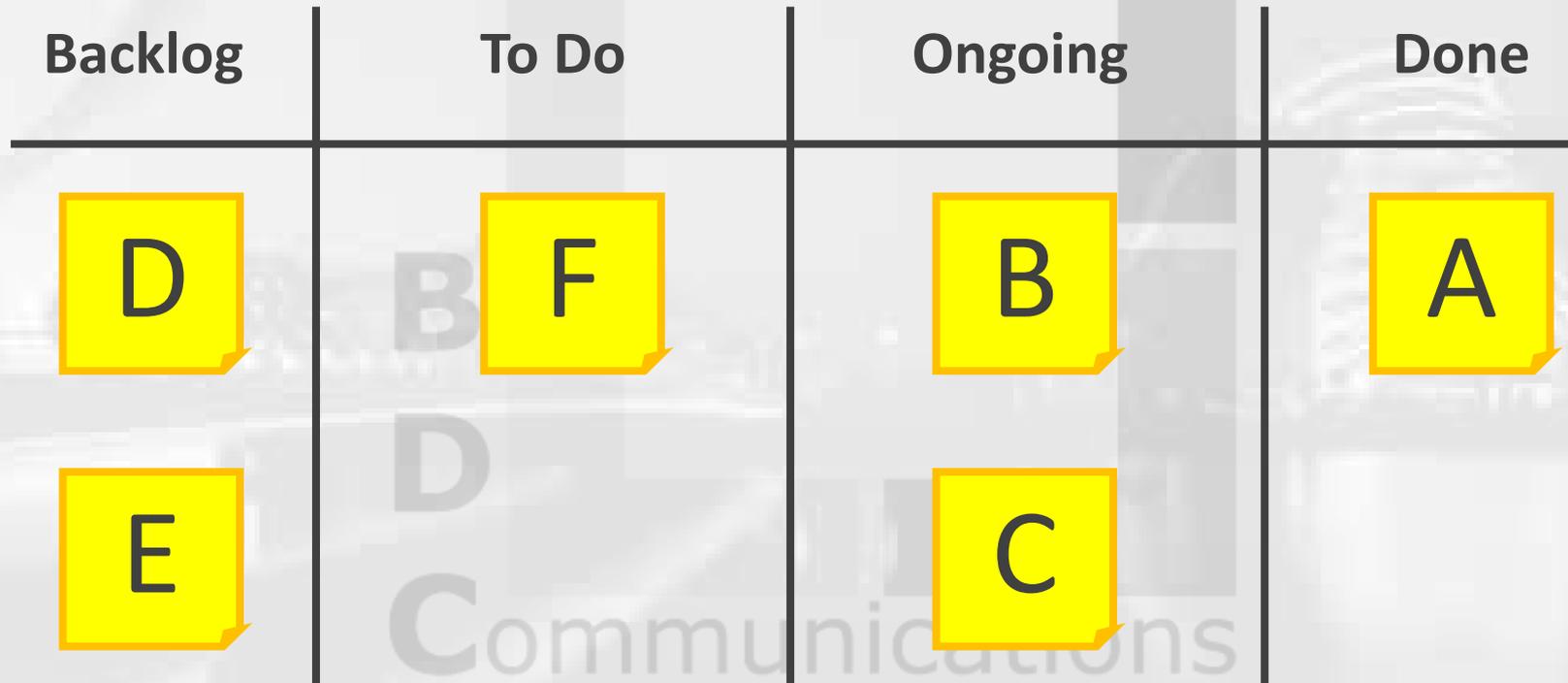
Force Field Analysis

You should identify what your desired state is (what success looks like), what forces drive the change and what forces resist the change. For each force, you should decide how strong it is while remembering that number of forces does not equate to strength or impassibility:

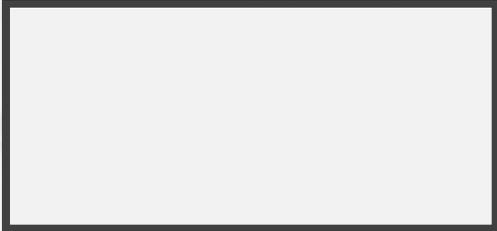


Kanban

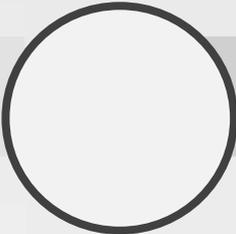
Kanban is a planning and tracking approach. This can be done with sticky notes or using technological tools.



Flow Charts



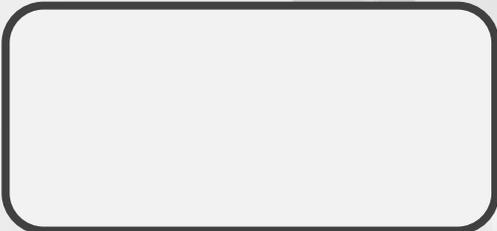
action



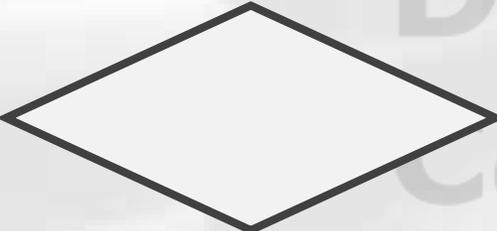
connector



document



start / end



decision



direction

Why Do Business English Trainers Need This?

Business English trainers need to adapt; it is not enough to offer “English language lessons” regardless of how you brand yourself (as a trainer or a qualified or unqualified coach).

Any Six Sigma process relies on:

1. Effective communication.
2. Leadership (itself developed through communication training).

Improvement in the workplace requires functional communication skills and utilises advanced lexis. English may be the language of a Six Sigma project. Six Sigma leaders also need to achieve “buy-in” and influence others across the organisation.

Trainers can:

1. Gain a certification in Six Sigma and train participants in the methodology.
2. Use quality improvement as part of a simulation or project.
3. Train the language and concepts of Six Sigma for quality, improvement and so on.
4. Use associated tools as carriers of language or training tasks (such as Ishikawa diagrams).
5. Use Six Sigma simulation as part of a task-based approach.

Qualified coaches can support the process.

This also develop additional competences including critical thinking, leadership and collaboration.

Recommended Reading

Brue, Greg (2015) *Six Sigma for Managers* 2nd edition. New York etc.: McGraw-Hill.

Evans, Vaughan (2013) *Key Strategy Tools*. Harlow: Pearson.

McGrath, James and Bates, Bob (2013) *The Little Big Book of Management Theories*. Harlow: Pearson.

B
D
C
Communications

Questions



Any questions?

Communications

Follow Up

E-mail: ben@bd-comms.eu

Website: www.bd-comms.eu

Phone: +44 7437 017435

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